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DIRECTORATE OF INTELLIGENCE

# Intelligence Memorandum

*Africa's Role In World Iron Ore Trade*

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
July 1971

INTELLIGENCE MEMORANDUM

# AFRICA'S ROLE IN WORLD IRON ORE TRADE

## Introduction

1. Abundant high-grade iron ore supplies and improved production methods and transport systems are making Africa increasingly important to world iron and steel industries. Iron ore output increased from about 4 million tons 1/ in iron content in 1950 to more than 35 million tons in 1969, and programs for further expansion, mainly in Sub-Saharan Africa, are designed to double the 1969 figure by 1980. Because of Africa's industrial backwardness, virtually all mines are developed by foreign interests exclusively for export. Income from the exports, however, is highly significant, often accounting for a large part of the producing country's national income. This memorandum examines Africa's development of iron mining and export since World War II and assesses its place in the world iron ore market.

## Discussion

### The World Iron Ore Market

2. Since World War II, Africa has become an increasingly important source of iron ore. Although the continent has long been known to possess large reserves of iron ore, the deposits were mostly undeveloped; steel producing nations relied on local sources or those relatively close by. However, the tremendous growth of steel production after World War II soon outstripped local iron ore supplies and forced the major producers to look overseas, particularly among the less developed countries. Although much of the continent's estimated 20 billion tons of reserves 2/ is located

*1. Unless otherwise indicated, tonnages in this memorandum are in terms of iron content and are given in metric tons.*
*2. World resources of iron ore are estimated at 125 billion tons, with an additional potential reserve of 265 billion tons.*

*Note: This memorandum was prepared by the Office of Economic Research and coordinated within the Directorate of Intelligence.*

inland and is relatively inaccessible, a number of countries, notably Liberia, Sierra Leone, South Africa, and Swaziland, do have large deposits of high-grade ore not far from seaports. Except for South Africa, these countries mine ore exclusively for export.

3. While world iron ore demand has increased steadily since World War II, it grew most rapidly in the 1960s, when consumption increased by about one-third, reaching more than 360 million tons in 1969. Although growth may slow somewhat, ore production is expected to exceed the level of one-half billion tons by 1980. Reflecting the increasing dependence of steel producing nations on foreign ore supplies and the emergence of major steel producers lacking domestic ores, such as Japan, the share of world iron ore production entering world trade increased from 25% in the 1950s to 33% in the 1960s; in the 1970s the share is expected to increase to 40%.

4. Except for the USSR and Eastern Europe, the share of world production of all the traditional major iron ore producing areas declined during the 1960s, as Australia and Africa grew in importance. Australian output rose from 3 million tons in 1960 to 20 million tons in 1969, and its share of the world total increased from 1.2% to 5.2%. Africa's growth was from 2 million tons to about 35 million tons, and its share of world output more than doubled to reach 9.1%. The share of other producers in world production either increased modestly or declined. The changing contribution of iron ore producers, by continental group between 1960 and 1969 was as given in the accompanying tabulation.

| | 1960 | | 1969 | |
|---|---|---|---|---|
| | Million Metric Tons | Percent of World Total | Million Metric Tons | Percent of World Total |
| Western Europe | 51 | 20.7 | 70 | 18.2 |
| USSR and Eastern Europe | 65 | 26.4 | 105 | 27.2 |
| Asia | 32 | 13.1 | 45 | 11.7 |
| North America | 59 | 23.8 | 70 | 18.2 |
| South America | 27 | 11.1 | 40 | 10.4 |
| Africa | 9 | 3.7 | 35 | 9.1 |
| Australia | 3 | 1.2 | 20 | 5.2 |
| *Total* | *246* | *100.0* | *385* | *100.0* |

5. The continued rapid development of high-grade iron ore resources in Africa, South America, and Australia, combined with some decline in ore production in steel producing nations, is inevitable. In Africa, expansion will occur primarily in Sub-Saharan areas, as enormous untapped inland

deposits are developed in response to increased demand and the decline of traditional sources. North Africa is expected to fall in relative importance because its readily available deposits are near exhaustion. In 1968, only about 8% of African iron ore exports came from Algeria, Tunisia, and Morocco, the principal North African producers, in marked contrast to the 52% in 1960.

6. Despite growing world reliance on deposits located great distances from the major consumers, delivered iron ore prices have declined more or less steadily for more than a decade. Delivered prices in Europe in 1971 are 40% to 50% lower than in 1957, owing in part to the lower ocean shipping costs brought about by the development of large ore carriers and in part to shipping economies realized from the increased iron content of the ores. The increasing use of higher grade ores by the world steel producers became sharply evident during the last decade when the growth rate of mine output in terms of iron content rose to 6.3% annually, while the growth rate for gross tonnage of ore remained virtually unchanged.

Sub-Saharan Production

7. Almost all Sub-Saharan African iron ore comes from seven countries: Liberia, South Africa, Mauritania, Angola, Sierra Leone, Swaziland, and Rhodesia. Liberia is the leader by far; its 1969 production of 15 million tons was more than 2.5 times that of either South Africa or Mauritania (see Figure 1). Angola, with 3.2 million tons, ranked fourth among the seven, and Sierra Leone and Swaziland were fifth and sixth, with production levels of about 1.4 million tons each. Rhodesia, the smallest producer, recorded about 600,000 tons in 1969. In addition, Sudan is a minor and erratic producer, and Guinea, which previously produced about 400,000 tons annually, stopped production after 1967.

8. Although all seven countries increased production during the 1960s, their relative importance changed significantly (see Figure 2). Liberia retained its dominant position with a growth rate that approached that of Mauritania, Angola, and Swaziland, the three whose output expanded rapidly in the 1960s as new mines were opened. Liberia's rapid growth was due to opening three new mines in addition to expanding the very large one already producing. The relative importance of both South Africa and Sierra Leone declined as output grew rather slowly. Much of South Africa's production is determined by domestic needs, and Sierra Leone has only one mine, which operated at about capacity. Rhodesia's output also increased as the result of opening a new mining area in 1961, but production remained well below the output of the other six. (For comparative rates of growth of iron ore production in Sub-Saharan countries and the world, see Figure 3.)


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*Figure 1*

**African Iron Ore Production in Terms of Iron Content, 1969**

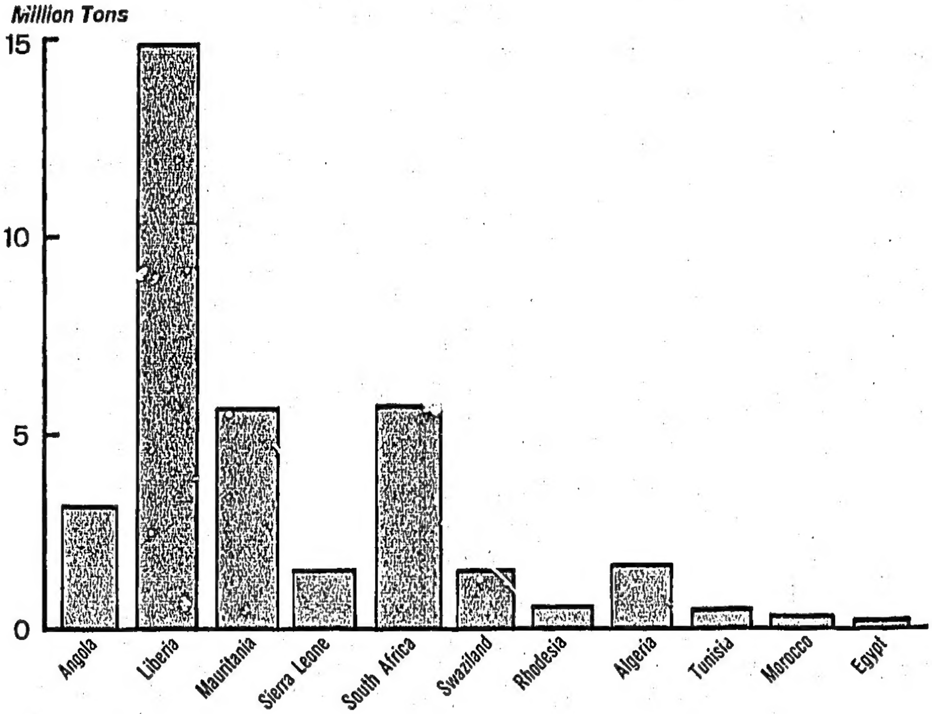


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*Figure 2*

**African Iron Ore Production by Percent**

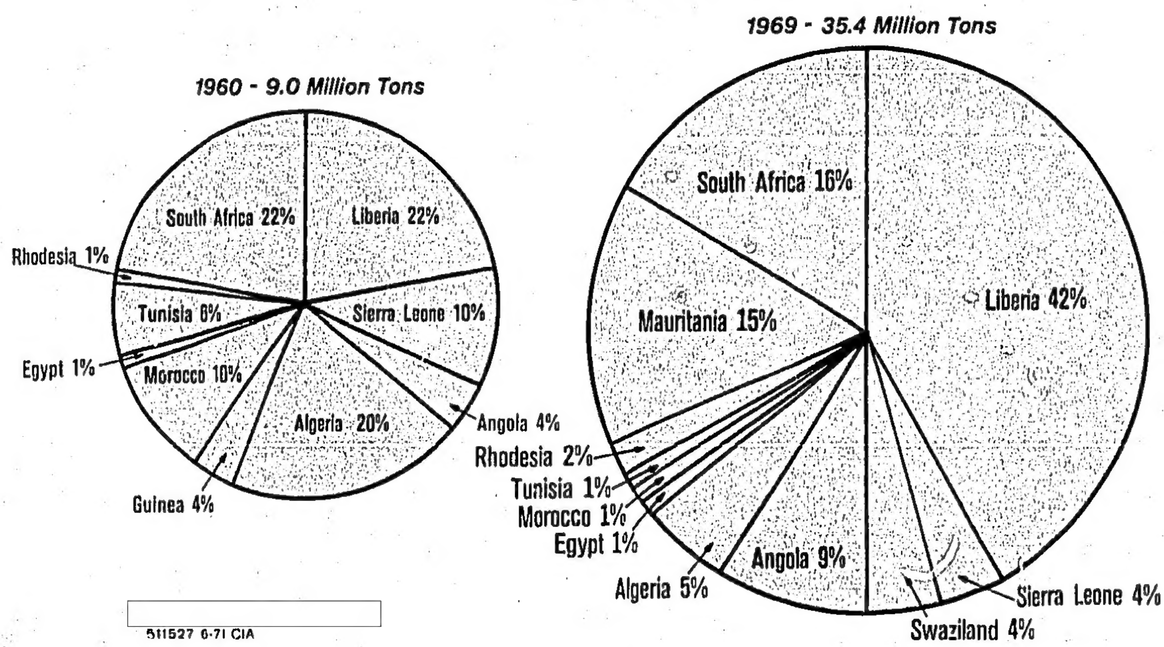


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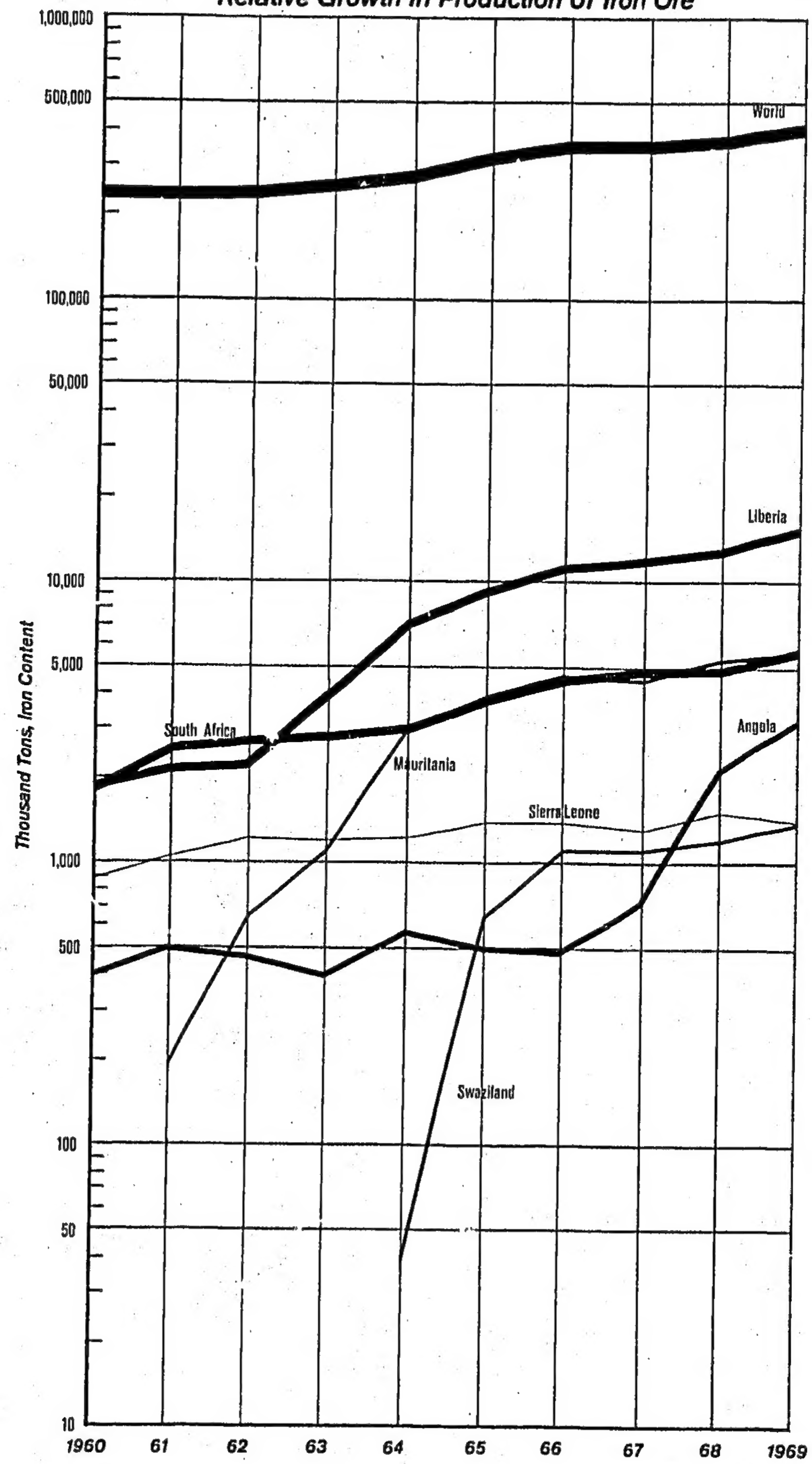
Figure 3

Relative Growth in Production of Iron Ore

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## North African Production

9. In contrast to the vigorous and fast growing mining area in Sub-Saharan Africa, the iron ore industries of Algeria, Tunisia, Morocco, and Egypt have shown little growth. Since no significant new iron ore ventures are contemplated in these states in the near future, production increases will come mainly from expanding existing facilities. North African proved reserves, roughly 270 million tons, have an average iron content of 55%; production at present is below capacity and under increasing competition from producers of higher grade ore. In 1969, North African production was as given in the accompanying tabulation.

| | Million Metric Tons |
|---|---|
| Algeria | 1.6 |
| Tunisia | 0.5 |
| Morocco | 0.4 |
| Egypt | 0.2 |
| *Total* | *2.7* |

## African Iron Ore Trade

10. African ores are highly competitive on the world market, and, as a consequence, the continent's share of world iron ore exports rose from about 13% in 1960 to more than 23% in 1969. The iron content of reserves is extremely high by world standards, averaging 64% compared with the US average of 58% and the Soviet average of 55%. This high iron content reduces both steel production and transport costs. In 1970 the delivered price of African ores, in terms of iron content, was actually cheaper than that of ores mined in some of the major steel producing nations despite the long ocean haul.

11. All major iron mining countries in Sub-Saharan Africa, except Rhodesia and South Africa (the only countries with domestic steel industries), export their entire production. Many mines are captive or semi-captive – that is, they are owned in whole or in part by foreign steel companies and sell all or a substantial part of their output to their owners. However, several African governments, such as Liberia's, have used public money to develop some of their iron ore resources as an export industry.

12. Sub-Saharan African iron ore is exported mainly to Western Europe and, to a lesser extent, to the United States and Japan (see the

map, Figure 4). Liberia, the world's third largest exporter, has long-term contracts with Italy, Belgium, France, West Germany, the United States, the United Kingdom, Japan, and other countries. Mauritania, the world's tenth ranking exporter, ships ore mainly to the West European owners (France, the United Kingdom, Italy, and West Germany) of its Fort Gouraud mine (Kedia d'Idjil), and the remainder to Belgium and Japan. Sierra Leone, Africa's oldest iron ore exporter, sells primarily to the United Kingdom, with most of the remainder going to the Netherlands, West Germany, and Italy. In 1968 the Japanese contracted to buy about 740,000 tons of Sierra Leone ore annually until the end of 1974, with a possible extension to 1979. Exports from Guinea had a very limited market because the chrome content of these ores made them costly to process; the ores were used for special purposes in the United Kingdom, Austria, and Eastern Europe, but the mine is no longer operating. Rhodesia produces mainly for domestic consumption, and South Africa exports about one-quarter of its output to Japan. Angola, since its recent increase in output, ships about 3.2 million tons of iron ore to West Germany, Japan, the United Kingdom, and France. All of Swaziland's production goes to Japan under a 10-year contract (1964-73), totaling 15 million tons. A deposit of nearly 150 million additional tons of ore, poorer in grade than the 61%-64% ore now being mined, will be developed if the contract is extended, as now seems probable. The values of Sub-Saharan African iron ore exports for 1969 were as given in the accompanying tabulation.

| | Million US $ |
|---|---|
| Liberia | 126.0 |
| Angola | 44.0 |
| Mauritania | 62.7 |
| Sierra Leone | 11.8 |
| South Africa | 27.0 |
| Swaziland | 13.4 |
| *Total* | *284.9* |

13. All North African countries except Egypt, which consumes all of its production in the Hulwan steel mill, export most of their mined ore. Steel mills in Tunisia and Algeria use relatively small quantities, much of which is low grade and unsuitable for export. North Africa, however, is seeking new outlets in the central and eastern Mediterranean where lower shipping costs tend to offset the relatively low grade of the ores. Because higher grade ores in many of the smaller mines are being depleted, North African exports have been declining. Algeria exports mainly to countries of the European Community, especially Italy, and annual shipments of 130,000 tons to Japan have been contracted recently. Most Tunisian exports

go to Italy, with smaller shipments to Yugoslavia and Czechoslovakia. Morocco exports mainly to Spain, West Germany, and the United Kingdom.

## Role in African Economies

14. Africa's developing iron ore industries and their associated infrastructure play an important role in many countries. In most, they represent a large share of invested capital, national product, and export earnings and are an important source of revenue to railroads and ports. Because capital-intensive techniques are generally used, the impact on employment is relatively small. However, the mining companies usually pay above-average wages and provide housing, schools, and free medical attention. Iron mining royalties and tax payments provide significant revenues to African governments, but particularly to Liberia, Mauritania, Sierra Leone, Angola and Swaziland. Development of iron ore mining (see Figures 5 and 6) has increased the fortunes of Liberia and Mauritania markedly, while potential iron ore reserves may help economic development in Gabon, Guinea, Ivory Coast, and Mozambique.

### Liberia

15. In Liberia, iron ore mining is the leading industry, accounting for about 30% of gross domestic product and 70% of exports. Four international companies, operating under concessions granted by the government, dominate the industry. Principal control is held by US, West German, and Swedish interests. Total investment in the industry from start of operations in 1951 to the end of 1968 was $448 million, with the accumulated cost of plant and equipment accounting for 94%, materials and supplies 4%, and stocks 2%. Employment in the iron ore industry is 10,000, or about 9% of those regularly employed outside the subsistence sector.

### Mauritania

16. Iron ore mining in Mauritania accounts for more than one-third of gross national product and nearly 90% of exports. The mining complex is owned by MIFERMA (Iron Mining Company of Mauritania), an international company with majority interest held by French, British, Italian, and West German steel companies, and 5% by the Mauritanian government. MIFERMA pays taxes equal to 50% of its profits, amounting in 1970 to $6.2 million, or about 21% of the general budget receipts. The complex currently employs 4,250 workers, or about 25% of the wage earners of the Mauritanian public and private sectors. Total investment from 1960 through 1969 was $201.6 million, including a $66 million loan granted by the International Bank for Research and Development (IBRD) in 1960.

**Sub-Saharan Flow of Iron Ore Exports, 1969** *(Million Tons)*

*Figure 4*


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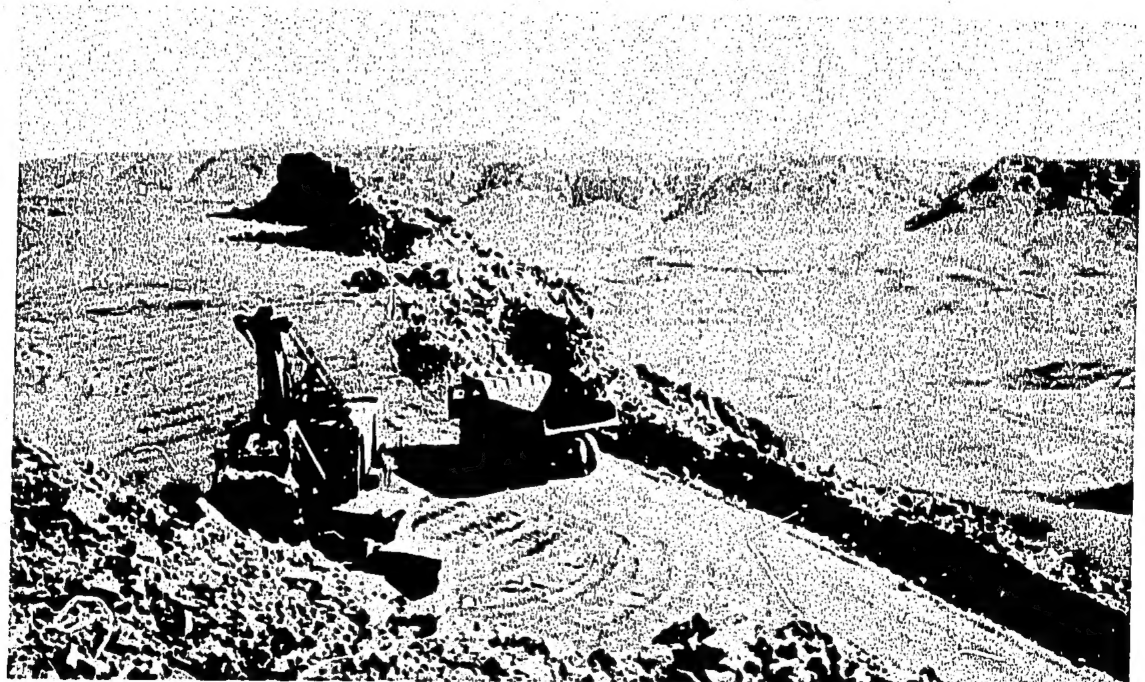

Figure 5. Mauritania: Fort Gouraud Iron Mine

Figure 6. Liberia: Large-Scale Installation for Load-ing Iron Ore at Bomi Hills

### Angola

17. Iron ore has become a resource almost as valuable as diamonds, which long have been Angola's most important mineral. Iron ore exports of $52 million in 1970 accounted for about 10% of total exports. Production is from the Cassinga mines in southern Angola where investment, amounting to more than $100 million, was at first undertaken by private Portuguese interests, but the Portuguese government subsequently assumed 85% of the equity. Much of the investment went into infrastructure: construction of housing and services for 4,000 workers and their families in a previously uninhabited area, improvement and extension of the railroad to Mocamedes, and expansion of the port facilities there.

### Sierra Leone

18. Iron ore, Sierra Leone's second most important export after diamonds, accounted for 11.4% of total exports in 1969. Mining has been carried on since 1933 from deposits near Marampa by the British-owned Sierra Leone Development Co., Ltd. (DELCO). Tax revenue is derived from the mining company by the government through a general corporate income tax of a flat 45% of net profits plus additional concession duties based on the amount of net profit. DELCO completed a $25 million investment program in 1964.

### Swaziland

19. In Swaziland, iron ore accounts for about 65% of mineral exports and 22% of total exports. The mine, at Ngwenya, close to the western border, is operated by the Swaziland Iron Ore Development Company (SIODC), which is controlled by the Anglo-American Corporation of South Africa. SIODC is under contract to supply the ore produced -- about 15 million tons over a 10-year period -- to Japanese steel companies. SIODC pays taxes to the Swaziland government at a rate of 27% to 37.5% of income. In 1969, SIODC transferred to Swaziland a 20% equity participation in the company. Swaziland will pay for this share from future dividends.

## Development Prospects

20. Africa's iron ore producers, particularly those in Sub-Saharan Africa, have extensive programs for development, based largely on foreign private investment; by 1980, output is expected to surpass 70 million tons annually. An international consortium consisting of US, UK, West European, and Japanese interests is considering investing $300 million to develop deposits in the Wologisi Mountains, in the northwestern tip of Liberia near the Guinea and Sierra Leone borders. In Mauritania, the internationally

owned company, MIFERMA, plans to invest about $26.6 million in production facilities and $5 million to enlarge port facilities at Cansado. A joint Portuguese and West German venture to invest $70 million in a pelletizing plant near low-grade iron ore deposits in Angola's Cassala region, east of Luanda, is under study. The British-owned company DELCO is spending more than $7 million to expand production at Sierra Leone's Marampa mine and to enlarge port facilities at Pepel.

21. Similar development projects are planned for other iron ore areas of Africa where conditions are considered favorable. In Guinea, where production ceased in 1967, an agreement was signed in 1970 between the government and an international consortium comprising 12 firms, including US Steel, Finsider of Italy, DCS of Spain, and the Binshi Steel Co. of Japan to exploit the large and rich Nimba-Simandou deposits in southeast Guinea near the Liberian border. Investment in the Nimba project, including transport, may reach $100 million. In Mozambique, the Portuguese government is studying the feasibility of a $7 million steel producing operation in the Villa Pery district near the Rhodesian border, where an estimated 200 million tons of high-grade iron ore have been proved. Additionally, the Sumitomo group of Japan will prospect jointly with Mozambique interests for iron ore in Namapa, in the Mirrote area. The US Pickands-Mather Corp. is considering investing more than $200 million in iron ore mining and pelletizing facilities in the western part of Ivory Coast.

## Conclusions

22. Africa increased iron ore production from about 9 million tons in 1960 to more than 35 million tons in 1969. This rapid growth, contrasted with stagnating iron ore production in the steel producing nations, has resulted in African countries increasing their share of total world iron ore exports from about 13% in 1960 to more than 23% in 1969. Important mining projects under way in Sub-Saharan Africa are expected to increase production further to more than 70 million tons annually within the next 10 years. Africa's iron ore resources are tremendous, and ores are comparatively high grade.

23. Built almost entirely with foreign capital, the iron mining industries continue to rely on outside financing for projects involving substantial capital outlays. Since World War II, iron ore producers have invested more than $800 million, nearly all financed externally. Much of Africa's iron ore industry is owned in whole or in part by steel companies that consume most of the output. Developments under way and planned by foreign enterprises in the Sub-Saharan mining areas will require an additional investment of about $1.5 billion.

24. Political and economic stability will be the principal factors influencing the role of African countries in world iron ore trade. The Liberian industry has perhaps the greatest expansion potential, but prospects are also favorable for Mauritania, Angola, Sierra Leone, and Swaziland, whose markets are established and growing. South African and Rhodesian production is adapted primarily to meet the needs of domestic steel industries, but the South African industry has great potential for expansion, and Japan has shown considerable interest in buying increasing quantities of South African iron ore. Guinea, Gabon, and Ivory Coast have the resources to support substantial iron ore industries, and the favorable investment climate in the latter two has encouraged extensive financing by foreign companies for their development.

25. Long-range market projections anticipate continued growth in world trade in iron ore, with much of the increase coming from Africa, South America, and Australia. World iron ore trade rose from 33 million tons 3/ in 1950 (out of a total output of 244 million tons) to 208 million tons by 1967 (world output 631 million tons), and this tonnage is expected to be doubled by 1980 with 75% being moved by sea. The recent rapid growth in the development of high-grade iron ore resources in Sub-Saharan Africa, combined with the decline in ore production in the more developed countries, undoubtedly will lead to a larger share of the world's iron ore market for the African areas.

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3. *In terms of total tonnage.*